

-A literature review-

# User-centered evaluation of adaptive and adaptable systems

L.S. van Velsen, T.M. van der Geest, R.F. Klaassen



University of Twente  
Enschede - The Netherlands

## Which methods are suitable and feasible for user-centered evaluations?

### Overview

We conducted a literature review on user-centered evaluation (UCE) studies of adaptive and / or adaptable (personalized) systems. Goal of the review is to provide an overview variables measured and methods used. A database of user-centered evaluations will be published on a website:

<http://projects.gw.utwente.nl/UCE2006/>

### Problems

1. Not all evaluation methods can take the **user characteristics and context** into account.
2. Tailored output of systems makes it difficult to **generalize** evaluation results.
3. It is unclear which UCE variables are most important and suitable for **measuring or predicting successful interaction** between user and personalized system.

### Selection of reports

The literature review is conducted by using the York method. This method aims at a systematic and empirical review. An increasing number of user-centered evaluations have been reported in the last 16 years. Over 4,000 article titles have been scanned. 55 Articles have been included in the review.

### Variables measured in evaluations

The following variables were measured (amount of reports which mention the variable between brackets):

1. Usability (n = 29)
2. Perceived usefulness (n = 24)
3. User behaviour (n = 24)
4. Appropriateness of adaptation (n = 21)
5. (future) System adoption (n = 21)
6. Attitudes (n = 16)
7. User satisfaction (n = 16)
8. System efficiency (n = 15)
9. User evaluation of system (n = 10)
10. User experience (n = 7)
11. Trust in system (n = 6)
12. System awareness (n = 1)
13. Other variables (n = 4)

### Widely used evaluation methods

1. Questionnaires: used for measuring usability and perceived usefulness.

*Is a self-reporting method suitable for measuring usability?*

*Evaluations suffer from small sample groups.*

*Full questionnaires should be included in the reports to improve future evaluation studies.*

2. Interviews: used for measuring (future) system adoption and appropriateness of adaptation.

*Mostly used in prototype evaluations.*

*Interviewing respondents post-hoc makes them forget possibly relevant incidents.*

*Qualitative methods do not contribute to general theories of personalization.*

3. Data logging: used for assessing user behaviour

*Data logging gives a very limited view of user behaviour.*

*Data logging should be complemented with qualitative methods to assess the rationale behind user behaviour.*

### Recommendations

When evaluating, report the evaluation method used and reflect on the evaluation process.

Focus on the user in early stages of the development process to optimize adaptation to user needs and usability.

### Wanted:

An adaptive or adaptable system for user-centered evaluation. Preferably alive. Any ideas?  
l.s.vanvelsen@utwente.nl

## The user-centered, iterative design process

